

WHAT IS CLAIMED IS:

1. A composition for forming a combined conversion and lubricating coating on a metal substrate with which the composition is brought into contact, the composition comprising:  
at least one oxyethylated aliphatic alcohol whose aliphatic hydrocarbon moiety contains 18 or more carbon atoms; and dissolved phosphate anions having a concentration of at least 0.2% of the composition.

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2. The composition for forming a combined conversion and lubricating coating claimed in claim 1 wherein the oxyethylated aliphatic alcohol is produced by condensing ethylene oxide with at least one primary straight chain aliphatic monoalcohol having at least 18 carbon atoms.

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3. The composition for forming a combined conversion and lubricating coating claimed in claim 1 wherein the oxyethylated aliphatic alcohol has a concentration of at least 0.5% of the composition.

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4. The composition for forming a combined conversion and lubricating coating claimed in claim 1 wherein oxyethylene units comprise at least 20% of the total mass of the oxyethylated aliphatic alcohol.

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5. The composition for forming a combined conversion and lubricating coating claimed in claim 1 wherein the phosphate anions have a concentration of between about 0.99% - 1.9% of the composition.

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6. The composition for forming a combined conversion and lubricating coating claimed in claim 1 further comprising:  
a component selected from the group of lithium salts, sodium salts, and calcium salts of fatty organic acids, wherein anions of

the fatty organic acids include at least 10 carbon atoms, and the cations are selected from the group consisting of sodium, lithium, and potassium.

5           7.     The composition for forming a combined conversion and lubricating coating claimed in claim 1 further comprising at least one inorganic boron containing compound in an amount effective to stabilize the pH value of the composition, the at least one inorganic boron containing compound being selected from the group consisting of inorganic boron containing acids and salts of inorganic boron containing  
10           acids, the ratio of the boron to the composition being not less than 0.002:1.0.

          8.     The composition for forming a combined conversion and lubricating coating claimed in claim 1 further comprising at least one agent  
15           for adjusting the pH of the composition selected from the group consisting of acidifying agents and alkalinizing agents , the pH value of the composition being at least 2.0.

          9.     The composition for forming a combined conversion and lubricating coating claimed in claim 1 further comprising an organic  
20           corrosion inhibitor, the organic corrosion inhibitor comprising a primary inhibitor and a secondary inhibitor, the primary inhibitor being selected from the group consisting of non-sulfur-containing organic azole compounds and the secondary inhibitor being selected from the group  
25           consisting of organic azoles that contain mercapto moieties.

          10.    The composition for forming a combined conversion and lubricating coating claimed in claim 1, further comprising a surfactant in an amount effective to promote uniform application of the composition to the  
30           substrate.

11. The composition for forming a combined conversion and lubricating coating claimed in claim 1 further comprising an anti-foam agent in an amount effective to prevent excessive foaming.

5 12. The composition for forming a combined conversion and lubricating coating claimed in claim 1 further comprising a phosphate conversion coating accelerator, the accelerator being selected from the group consisting of: 0.3 to 4 grams of chlorate ions per liter of the total  
10 coating composition; 0.01 to 0.2 g/l of nitrite ions; 0.05 to 2 g/l of m-nitrobenzene sulfonate ions; 0.05 to 2 g/l of m-nitrobenzoate ions; 0.05 to 2 g/l of p-nitrophenol; 0.005 to 0.15 g/l of hydrogen peroxide in free or bound form; 0.1 to 10 g/l of hydroxylamine in free or bound form; and 0.1 to 10 g/l of a reducing sugar.

15 13. The composition for forming a combined conversion and lubricating coating claimed in claim 1 wherein the at least one oxyethylated aliphatic alcohol contains an aliphatic hydrocarbon moiety having 30 to 60 carbon atoms per molecule.

20 14. The composition for forming a combined conversion and lubricating coating claimed in claim 1 wherein oxyethylene units comprise 30 to 70% of the total mass of the oxyethylated aliphatic alcohol.

25 15. A method of forming a combined conversion and lubricating coating on a metal substrate with which the composition has been brought into contact, the method comprising coating the metal substrate with the composition of claim 1 at a temperature of at least 30° Celsius and drying the composition on the metal substrate to form at least 0.5 grams of dried composition per square meter of surface.

16. The method of claim 15 further comprising heating the composition at a temperature between about 30°C and about 180°C to accelerate the drying of the composition and to promote chemical interaction among non-volatile components.

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17. A metal substrate having a combined conversion and lubricating coating thereon made by the process of claim 15.